



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/772,310	02/06/2004	Alexander Epple	Q79380	7421

23373 7590 08/10/2004
SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER

RAIZEN, DEBORAH A

ART UNIT PAPER NUMBER

2873

DATE MAILED: 08/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/772,310

Applicant(s)

EPPLE ET AL.

Examiner

Deborah A. Raizen

Art Unit

2873

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28, 30-34 and 36-42 is/are rejected.
- 7) ☒ Claim(s) 29 and 35 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☐ Certified copies of the priority documents have been received.
 - 2) ☒ Certified copies of the priority documents have been received in Application No. 10/152,290.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. 10/152,290 (now US Patent 6,717,746), filed on May 22, 2002. ***Claim Objections***

2. Claims 1 and 21 are objected to because of the following informalities:

In claim 1, in the next-to-last line, there is a space between “deflect” and “or”.

In claim 21, line 14, the word “dioptric” is necessary between “said” and “section”.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 25-28, 30-34, and 36-40 are rejected under 35 U.S.C. 102(e) as being anticipated by Shafer et al. (US 2004/0075894 A1).

The applied reference has a common inventor and a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior

Art Unit: 2873

art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

5. Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

In regard to claim 25, Shafer discloses a catadioptric projection lens (Fig. 5, fourth embodiment) for imaging a pattern situated in an object plane (2) of the projection lens onto an image plane (4) of the projection lens while creating at least one real intermediate image (3), comprising:

- a catadioptric imaging group (5) with a concave mirror (drawn at the bottom of the figure);

- a geometric beam splitter (7) having a reflective surface (10) for reflecting radiation coming from the concave mirror towards the image plane (Fig. 5); and

- a dioptric imaging lens group (8) arranged following said catadioptric imaging group (Fig. 5);

wherein:

- the catadioptric imaging group is arranged to create said intermediate image (Fig. 5);

- the dioptric imaging lens group (including lens 320) is arranged to image said intermediate image onto the image plane (Fig. 5); and

Art Unit: 2873

at least one lens (320) is arranged between said reflective surface (10) of the geometric beam splitter and said intermediate image (Fig. 5).

In regard to claim 26, in the Shafer projection lens, the intermediate image is situated freely accessible in an empty space at a distance from a nearest optical component (Fig. 5, as compared to Figs. 1, 2, and 4 of the current application).

In regard to claim 27, in the Shafer projection lens, the intermediate image is situated at a distance from the reflective surface of the geometric beam splitter, where said distance is chosen such that the diameter of rays incident on a surface orthogonal to the optical axis at an intersection of said reflective surface with said optical axis (3.5 figure mm in Fig. 5) is at least 10% of the diameter of said concave mirror (33.5 figure mm).

In regard to claim 28, in the Shafer projection lens, positive refractive power is arranged between said reflective surface of the geometric beam splitter and said intermediate image (lens 320 is double convex).

In regard to claim 30, in the Shafer projection lens, a front lens is arranged on the object side ahead of said intermediate image (the negative meniscus lens that is the second lens up from the concave mirror) and a rear lens is arranged on the image side following said intermediate image (lens 320), and surfaces of the front lens and the rear lens facing said intermediate image are spherical (as shown in Fig. 5, the surfaces facing intermediate image 3 are not hatched; also, surfaces 8 and 18 from Table 7 are not listed in Table 8).

In regard to claim 31, Shafer discloses a catadioptric projection lens (Fig. 5, fourth embodiment) for imaging a pattern situated in an object plane (2) of the projection lens onto an

Art Unit: 2873

image plane (4) of the projection lens while creating at least one real intermediate image (3), comprising:

a catadioptric section (5) with a concave mirror (drawn at the bottom of the figure); and a geometric beam splitter (7) having a reflective surface (10) for reflecting radiation coming from the concave mirror towards the image plane (Fig. 5); and

a dioptric section (8) arranged following said catadioptric section (Fig. 5); wherein:
the catadioptric section is arranged to create said intermediate image (Fig. 5); and
at least one lens (320) is arranged between said reflective surface (10) and said intermediate image (Fig. 5).

In regard to claim 32, in the Shafer projection lens, the intermediate image is situated freely accessible in an empty space at a distance from a nearest optical component (Fig. 5, as compared to Figs. 1, 2, and 4 of the current application).

In regard to claim 33, in the Shafer projection lens, the intermediate image is situated at a distance from the reflective surface of the geometric beam splitter, where said distance is chosen such that the diameter of rays incident on a surface orthogonal to the optical axis at an intersection of said reflective surface with said optical axis (3.5 figure mm in Fig. 5) is at least 10% of the diameter of said concave mirror (33.5 figure mm).

In regard to claim 34, in the Shafer projection lens, positive refractive power is arranged between said reflective surface of the geometric beam splitter and said intermediate image (lens 320 is double convex).

In regard to claim 36, in the Shafer projection lens, a front lens is arranged on the object side ahead of said intermediate image (the negative meniscus lens that is the second lens up from

Art Unit: 2873

the concave mirror) and a rear lens is arranged on the image side following said intermediate image (lens 320), and surfaces of the front lens and the rear lens facing said intermediate image are spherical (as shown in Fig. 5, the surfaces facing intermediate image 3 are not hatched; also, surfaces 8 and 18 from Table 7 are not listed in Table 8).

In regard to claim 37, Shafer discloses a catadioptric projection lens (Fig. 5, fourth embodiment) for imaging a pattern situated in an object plane (2) of the projection lens onto an image plane (4) of the projection lens while creating at least one real intermediate image (3), comprising:

a catadioptric imaging group (5) with a concave mirror (drawn at the bottom of the figure) and a geometric beam splitter (the left side of 7) having a first reflective surface (9); and
a dioptric imaging lens group (8, including lens 320) arranged following said catadioptric imaging group (Fig. 5);

wherein:

the catadioptric imaging group is arranged to create said intermediate image (Fig. 5);
the dioptric imaging lens group (including lens 320) is arranged to image said intermediate image onto the image plane (Fig. 5);

a second reflective surface (10) is arranged within the dioptric imaging lens group between the intermediate image and the image plane; and

at least one lens (320) is arranged between said intermediate image (3) and said reflective surface (10; Fig. 5).

In regard to claim 38, in the Shafer projection lens, the intermediate image is situated freely accessible in an empty space at a distance from a nearest optical component (Fig. 5, as compared to Figs. 1, 2, and 4 of the current application).

In regard to claim 39, in the Shafer projection lens, the intermediate image is situated at a distance from the second reflective surface, where said distance is chosen such that the diameter of rays incident on a surface orthogonal to the optical axis at an intersection of said second reflective surface with said optical axis (3.5 figure mm in Fig. 5) is at least 10% of the diameter of said concave mirror (33.5 figure mm).

In regard to claim 40, in the Shafer projection lens, positive refractive power is arranged between said second reflective surface and said intermediate image (lens 320 is double convex).

6. Claims 37 and 39-42 are rejected under 35 U.S.C. 102(b) as being anticipated by Takahashi et al. (5,835,275).

In regard to claim 37, Takahashi discloses a catadioptric projection lens (Fig. 1) for imaging a pattern situated in an object plane (R) of the projection lens onto an image plane (W) of the projection lens while creating at least one real intermediate image (at M1), comprising:

a catadioptric imaging group (A) with a concave mirror (MC) and a geometric beam splitter (M1) having a first reflective surface (M1); and

a dioptric imaging lens group (B) arranged following said catadioptric imaging group (Fig. 1);

wherein:

the catadioptric imaging group is arranged to create said intermediate image (Fig. 1);

the dioptric imaging lens group is arranged to image said intermediate image onto the image plane (Fig. 1);

a second reflective surface (M2) is arranged within the dioptric imaging lens group between the intermediate image (at M1) and the image plane (W; Fig. 1); and

at least one lens (any of the three lenses of lens group B1) is arranged between said intermediate image (at M1) and said reflective surface (M2; Fig. 1).

In regard to claim 39, in the Takahashi projection lens, the intermediate image is situated at a distance from the second reflective surface, where said distance is chosen such that the diameter of rays incident on a surface orthogonal to the optical axis at an intersection of said second reflective surface with said optical axis (10 figure mm in Fig. 1) is at least 10% of the diameter of said concave mirror (27 figure mm).

In regard to claim 40, in the Takahashi projection lens, positive refractive power is arranged between said second reflective surface and said intermediate image (the left-most lens element of B1 is double convex).

In regard to claim 41, in the Takahashi projection lens, a front lens is arranged on the object side ahead of said intermediate image (the right side of the double-convex lens that is the upper-most lens element of A2) and a rear lens is arranged on the image side following said intermediate image (the left-most, double-convex lens element of B1), and the front lens and the rear lens are roughly symmetrically arranged with respect to said intermediate image (as can be seen in Fig. 1, the distances of the two lenses to the intermediate image are of the same order of magnitude, and their arrangement has reflection symmetry in a plane orthogonal to surface M1)

Art Unit: 2873

such that asymmetric contributions to imaging aberrations by the front lens and the rear lens due to heating of the front lens and the rear lens are at least partly compensated (this functional limitation is satisfied by the disclosed structure).

In regard to claim 42, in the Takahashi projection lens, a front lens is arranged on the object side ahead of said intermediate image (the right side of the double-convex lens that is the upper-most lens element of A2) and a rear lens is arranged on the image side following said intermediate image (the left-most, double-convex lens element of B1), and the front lens and the rear lens have positive refractive power (they are both double convex).

Double Patenting

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 1-24 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-24, respectively, of U.S. Patent No. 6,717,746.

Although the conflicting claims are not identical, they are not patentably distinct from each other because all the limitations recited in claims 1-24 of the current application are recited in the respective patent claims.

In regard to claim 1, claim 1 of the patent recites the limitations of current claim 1 as follows (the line numbers refer to lines in the claim as it appears in col. 17 of the published patent):

A catadioptric projection lens for imaging a pattern situated in an object plane of the projection lens onto an image plane of the projection lens while creating a real intermediate image, comprising (lines 1-4 of the patent claim 1):

a catadioptric section (line 5: “a catadioptric first section” is a catadioptric section) with a concave mirror (line 5) and a beam-deflector (line 6: “a beam-deflecting device” is a beam-deflector) located between said object plane and said image plane (lines 6-7); and

a dioptric section (line 8: “a dioptric second section” is a dioptric section) arranged following said beam-deflector (lines 8-9);

said dioptric section (in line 10, “said second section” refers to the dioptric section) starting after a final reflective surface of said catadioptric section and comprising at least one lens arranged between said final reflective surface and said intermediate image (lines 10-13); and

said beam-deflector being a geometric beam splitter (lines 14-15) having at least one reflective surface (line 15: “one planar reflective surface” is one reflective surface).

In regard to claims 2-24, the patent claims are nearly identical, and the differences are the same as those explained for claim 1.

Allowable Subject Matter

9. Claims 29 and 35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art taken either singularly or in combination fails to anticipate or fairly suggest the limitations of claims 29 and 35, in such a manner that a rejection under 35 U.S.C. 102 or 103 would be proper.

The prior art fails to teach a combination of all the features in claims 29 and 35. For example, these features include the detailed structure recited in respective base claims 25 and 31 and also the limitations that the front lens and the rear lens are roughly symmetrically arranged with respect to said intermediate image such that asymmetric contributions to imaging aberrations by the front lens and the rear lens due to heating of the front lens and the rear lens are at least partly compensated, in combination with all the other limitations of the claim.

Conclusion

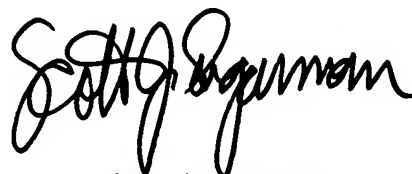
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deborah A. Raizen, Ph.D., J.D., whose telephone number is (571) 272-2336. The examiner can normally be reached on Monday-Friday, from 10:00 a.m. to 3:00 p.m. Eastern Standard Time (a part-time schedule).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Y. Epps can be reached at (571) 272-2328. The USPTO central official fax number is (703) 872-9306 (please note that this number is different from the previous two numbers provided until the summer of 2003).

Art Unit: 2873

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or at 703-305-3028 or at 703-308-6845 between the hours of 6 a.m. and midnight Monday through Friday EST, or by e-mail at: ebc@uspto.gov. Additional information is available on the Patent EBC Web site at: <http://www.uspto.gov/ebc/index.html>.

dar

A handwritten signature in black ink, appearing to read "Scott J. Sugarman". The signature is stylized with a large, looped "S" and a cursive "J".

Scott J. Sugarman
Primary Examiner